Aligning Higher Education in Ukraine with the Demands for Data Science Workforce

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Abstract

Accelerated technological development in the context of the Fourth Industrial Revolution changed the nature of competition in world markets, increasing the importance of technological opportunities as a source of competitive advantage and identifying technology as a key factor in production. Every year, digital technologies change everyday life, creating the foundations for sustainable socio-economic development. Changes resulting from the revolution in information technology signal the need for new approaches to training, particularly in Ukraine. Technologies are improving at a fairly rapid pace, but the methodological base at the level of Ukrainian high education institutions (HEIs) is adapting to such changes rather slowly, which, accordingly, slows down the process of "smarting" of education. In turn, graduates are not the most attractive for the modern labour market. This article highlights the urgent need for extensive training in this area. In turn, the paper aims to offer a case of the study programme for graduating data science analysts (DSAs). The original approach is the master degree programme case for the social science faculty but not for engineering faculty as it is traditionally. The necessity of DSAs is extremely high in the economic field/business however mostly graduates of the engineering faculties having strong programming skills lack the economic knowledge and understanding of business laws. The contribution of the paper is that the proposed program differs from existing ones on the market, but is not implemented in HEIs, with its systematical adaptability to the requirements of the state standard; as well it meets all the requirements of employers in the field of Data Science. The paper is mostly in the practical and descriptive area thus the methodological base of the research are general scientific research methods like historical method, comparative analysis, methods of analyses & synthesis, system approach and logical generalization.

Keywords

Data Science, Educational program, Entrepreneur university, Skills

1. Introduction

Each year digitalization changes economies and societies. The relationship between them is re-evaluated, reflecting the major transformations of development, in which business models and regulatory regimes specific to a particular period are gradually changing. A fundamentally new – digital – environment is being formed, new ecosystems and models of economic development are being formed. Digital transformation has become one of the main drivers of global change that is taking place today in the context of social "gaps" in societies and the financial "inequality" of countries. Today, the world is at the crossroads of digital technology that generate as many opportunities as risks that have redefined our way of life and daily activities. The use of digital technologies has the effect of increasing productivity, employment and welfare, improving the quality of the environment, and meeting challenges in the areas of health, education and public administration [1]. Today it is necessary to

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understand how digital technologies will change the lives of present and future generations and what changes can be expected in the socio-economic and socio-political dimensions, and most importantly – what will be their impact (more positive or negative). There are fears that digitalization will result in the "displacement" of workers in certain professions, which will lead to additional digital gaps and greater inequality among the population. Of course, education cannot stay away from such megatrends and must adapt to new realities – reducing the need for some professions and the emergence of demand for new professions, new skills and new competencies.

Thus, during the development of the fourth industrial revolution, led by advances in big data technology and artificial intelligence, humanity is again facing major changes in the labour market. Big Data Analytics (BDA) is already becoming one of the most popular tasks in modern times [2-3]. According to Frost & Sullivan, in 2021 the total global market for BDA will increase more than 2.5 times compared to 2016 and will amount to $ 67.2 billion, with an annual growth rate of 35. 9%. Already today, the amount of data generated by mankind exceeds 30 Zettabytes (1 Zettabyte equals 63 million years of 4K video viewing), and by 2025 is expected to be 400 zettabytes.

Most modern companies, realizing the challenges of digitalization, state the need for DSAs as the priority. Demand for business people with analytic skills, and not just scientists, has increased many times (Table 1). For example, there is 23% search for DSA-trained researchers and 67% are just DSA-supported professionals from 2.35 million job postings in the United States. Moreover, not just operating professionals are in demand today if they have DSA competencies. There is a great demand for managers and decision-makers (including general management) who have the skills/understanding of data science (data analytics) (Table 2).

Table 1

Demand for DSA enabled jobs, %

	Finance and Insurance	Health care and Social Assistance	Information	Manufacturing	Professional. Scientific, and Technical Services	Retail Trade
Data-driven decision-makers	26	32	43	45	30	46
Functional analysts	51	44	23	25	29	35
Data engineers	13	15	26	23	31	13
Data analysts	5	5	4	4	6	4
Data scientist and advanced analysts	2	2	2	2	2	2

Source: *http://www.uazone.org/demch/presentations/bdais2017-11-03-panel-data-talents-v04.pdf*

Table 2

Percent of employers who say data science and analytics skills will be 'required of all managers' by 2020

Branch	Per cent
Finance and accounting managers	59
Marketing and sales managers	51
Executive leaders	49
Operations managers	48
Supply chain and logistics managers	40
Human resources managers	30

Source: *BHEF and Gallup, Data Science and Analytics Business Survey (December 2016)*

OECD (Organisation for EconomicCooperation and Development) [1] claimed that the demand for a new type of "dynamic self-re-skilling workforce" is growing exponentially. UN announced that Data literacy (i.e. critical analyse at a collected dataset and data visualisation) is defined as key for the digital revolution and Industry 4.0 [2].

The market for educational services has also experienced these trends. Digital transformation is gradually embracing all new areas of business and life, transforming standard education and research processes, models and entire universities. Along with the development of information technologies and digitalization processes, HEIs are changing approaches to education, taking into account long-term development. Thus, Coursera recognizes Data Science as one of the three most promising areas of education, and LinkedIn recognizes the profession of Data Scientist as one of the most promising modern professions with more than 10,000 vacancies and an annual growth rate of demand of 37%. HEIs in Ukraine are only slowly beginning to take steps to develop specific programs in the training of such specialists. Having a look at the list of proposals from the Ukrainian HEIs, most of the training of such specialists is carried out at technical faculties. However, if one looks at the set of requirements that the market puts forward to a specialist in data science [4], it is expected to consider the best result of training in a comprehensive interdisciplinary combination.

The collection, edited by T. Hey [5], clearly states that not only practice but also science is changing. If a few decades ago to solve the problem it was necessary to put forward a theory, hypothesis, experiment. Then it had been gradually changing through the analysis of models, the introduction of digital modelling. However, this approach is inferior to new ideas, which consist of the widespread involvement of computer power not only in information processing but also in the implementation of scientific discoveries based on data. The ability to process information, discover databases and certain patterns allows us to talk about the introduction of a new computer-human economy. In the computer market, it significantly changes the role of a person. Therefore, it is not enough to be a plain user of computer software or a narrow-profile analyst of computer equipment. Thus, the modern market requires a new level of specialists.

It should be emphasized that this is not about training software development specialists or database specialists. There is a need for professionals who can use and implement complex mechanisms of machine learning, systems analysis, analytics, statistics and other sciences in the economic field, in real business at the enterprise level.

This article aims to expose a well-founded case, which reveals the methodological basis for the development and opening of the educational and scientific program for the preparation of masters in data science with a certain list of necessary soft & hard skills based on social science faculty. Given that the case itself is exclusively an author's development, and the HEIs of Ukraine do not yet provide extensive master's training in DSA, the novelty of this article is obvious. The structure of the article is based on the logic of substantiation of this case. Thus, the introductory part focuses on the urgency of the issue, on the pattern of digitalization, which has already permeated all educational services in the world and Ukraine, and on the high demand for DS specialists. The literature review allows us to understand how scientists and practitioners around the world confirm and analyze the need to take into account trends in digitalization and BDA in education and highlight the urgency of the need for such specialists. The methodological part of the article demonstrates a reasoned list of skills that are considered necessary for training and development in the training of specialists in the DSA. As a result, a list of subjects is demonstrated that can ensure the provision of appropriate training and competencies for masters - DSA. The case of the programme carried out at the Faculty of Economics is presented aligning within the long-term accreditation regulatory framework. Problematic within the topic and milestones remains for conclusions and the discussion part.

2. Literature review

The constant and deepening digitalization of economies and societies will only expand. Ukrainian education must be prepared for the scale of its maximization [6-7]. The 21 changes that will result from widespread digitization are identified in the Report of the World Economic Forum (WEF) for 2015 [8]. Particularly significant of them for the field of education are the changes caused by digitalization, which are expected by 2025:

- the country that will replace the census with data sources will be determined;

- 30% of the corporate audit will be carried out using AI technology;
- 10% of world GDP will be saved using blockchain technology.

Generally, the fourth paradigm of scientific research has taken data analysis to a new level – e-science (computing and information technology) has expanded classical science. Data has begun to exceed existing hypothetical theories, and, in turn, machine learning has opened new patterns and allowed us to formulate hypotheses in one or more spaces of knowledge [9]. Thus, "Big Data" – a set of methods and tools for processing structured and unstructured different types of data in real-time for analysis and use to make appropriate decisions in different segments – have become an important object of attention of educators to train relevant professionals. Effective use of large amounts of data can accelerate decision-making in many areas, resulting in improved citizens' lives and enabling companies and governments to provide the necessary services in real-time. Not surprisingly, the demand for professionals with the skills to work with such data is enormous, both within the country and abroad.

Digitization is becoming more powerful every year and full of not only opportunities but also risks. The introduction of digital technologies is a long process and can pose challenges and even create a danger to humanity: lack of knowledge and insufficient methodological and scientific validity of its practical implementation leads to complex engineering, socio-political and socio-economic problems. The rapid spread of technology is exacerbated by concerns about work automation. Concerns about rising unemployment caused by scientific and technological progress are not new [10]. The only way to avoid the inevitable "shift" of jobs associated with digitalization is to move on to learning and acquiring skills [11], which will provide unimpeded access to innovative services, as well as skills that prevent work from being automated or processed by anyone else, including customer service itself [12] (Fig. 1).

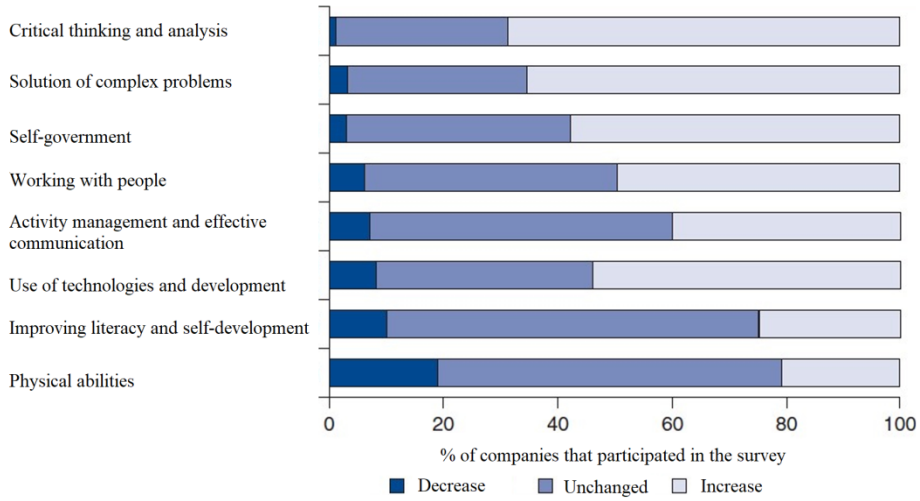

Figure 1: Diagram "Global demand for skills in 2025" Source: [13]

To benefit from the digital economy and adapt to new professions and skills needs, the education system must be focused on promoting general ICT skills, including digital literacy and critical thinking.

Scientists around the world are actively researching the impact of digitalization and the need for BDA on education [14-15]. In particular, these trends are associated with the knowledge economy [16]. Digital skills and competencies are considered highly essential to achieve professional success and the personal development of any individual [17-18]. Some scholars consider the transition of education to the principles of digitalization and extensive training of specialists with DSA as a panacea for economic development [19-20].

However, in addition to considering these trends only on the positive side, there are oppositionists of such a rapid overload of the educational process, who believe that the role of machine learning and BDA is a bit exaggerated and overestimated. The language used around the digitalization of education tends to be inherently political, value-laden, and deterministic [21].

There is a separate discussion in the research topic "digitalization in the education" [22-23] – new or updated skills and competencies that should belong to a modern specialist in the era of globalization, and even more so to a DSA specialist [17; 24-27]. From the critical review of the latest literature in the field, the following list can be aggregated:

- the ability to gather, analyze, and draw practical conclusions from data [28-29];
- the ability to communicate data findings to others [30-33].

Thus, with the advent of the Fourth Industrial Revolution, the increasing demand for data science analytics (DSA) workforce comes, which can help mitigate this issue of unemployment. Sadly, DSA skills remain underdeveloped among the Ukrainian workforce. Behind this is the school industry gap, wherein educational institutions fail to hone skills that meet industry demands. Ukrainian universities that are building data science degree programs for undergraduates should see increasing opportunities in the region and are decided to build a data science degree from the ground up, even without a pre-existing computer science department to leverage for courses or culture. The existing study programmes in DSA out of the HEIs are not competitors to such degree courses as they do not provide economic-background skills and could be very expensive financially if meeting demands in all soft skills boosting. So, the development of DSA master programmes is the necessity and the klondike for HEIs under the closest period.

The international educational area is reflecting the demand in DSA in two trends: the DSA study programmes at the engineering faculties of HEIs; the study (personal & professional growth) programmes developed by the large companies (eg Vodafone in Ukraine (BigDataLab [36-37])). However, there is a sensitive gap in the DSA programmes that include soft and economic skills as well, besides the technical component. The slight response could be found in MOOC courses where a student can choose any combination of courses and skills. So, the gap in the HEI education programmes is not just a feature of Ukraine but a worldwide tendency.

In this paper, we designed the case of an academically demanding curriculum that combines economics, mathematics, information systems, new data science courses, and soft skills that are also encouraged and supported graduates success.

3. Methodology

Taking into account that the paper is mostly in the practical and descriptive area thus the methodological base of the research is chosen as general scientific research methods like historical method, comparative analysis, methods of analyses & synthesis, system approach and logical generalization.

Thus, the main methodological gap is seen in the framework of DSA itself and the list of necessary components of DSA training that would combine as professional as well as social and economic skills.

So, despite the popularity, there continues to be a lack of consensus as to the definition of DSA. Understandably, DSA involves a wide range of skills that could not easily be captured by a single definition [34]. Thus, according to the 10 DSA competencies recommended by the Asia-Pacific Economic Cooperation [35] – Data scientists: Leverages statistical techniques and creates analytical models to derive new insights from quantitative and qualitative data. The professional job roles of DSA are characterized by a set of 10 applicable DSA competencies with the required proficiency level (APEC Human Resource Development Working Group 2017):

1. Operational analytics – use general and specialized business analytics techniques for the investigation of all relevant data to derive insight for decision making;
2. Data visualization and presentation – create and communicate actionable insights from data using visualization and presentation tools and technologies.
3. Data management and governance – develop and implement data management strategies, incorporating privacy and data security, policies and regulations, and ethical considerations;
4. Domain knowledge and application – apply domain-related knowledge and insights to effectively contextualize data, achieved by practical experience and exposure to emerging innovations;
5. Statistical techniques – apply statistical concepts and methodologies to data analysis;

6. Computing – apply information technology and computational thinking and utilize programming languages and software and hardware solutions for data analysis;
7. Methods and algorithms – implement and evaluate machine learning methods and algorithms on the data to derive insights for decision making.
8. Research methods – utilize the scientific and engineering methods to discover and create new knowledge and insights;
9. Data science engineering principles – use software and system engineering principles and modern computer technologies to develop DSA applications;
10. The 21st-century skills – exhibit cross-cutting skills essential for analytics at all levels, including, but not limited to, collaboration, ethical mindset, empathy, social and societal awareness, dynamic (self) reskilling, and entrepreneurship.

Business roundtable survey's experts (2017) indicated that DSA specialist currently lacks such skills: cybersecurity (97% of respondents); critical thinking and problem solving (83%); design/system thinking & innovation and creativity (79%); global perspective vision & cognitive flexibility (78%); cross-disciplinary ability (74%).

The mentioned frameworks help to design the prior list of skills and competencies (i.e. a demonstrated ability to apply knowledge, skills and attitudes for achieving observable results) to support the master degree programme that meets the demand of DSA specialists in Ukraine and worldwide.

4. Results: DSA programme description

The competency framework acknowledges that data scientists and DSA-enabled professionals possess varied combinations of the 10 competencies, with differences in their levels of mastery of business and organizational skills, technical skills, and workplace skills. Of course, unlike business schools or academies, such as Vodafone (Big Data Lab) & KSE [36-37], the university has its standards and must provide training specialists in a certain area in compliance with the state standard, i.e. for speciality 051 "Economics" [38], which requires graduates to master a clear set of competencies. We assume that this educational program must meet the current requirements of the Law on Higher Education [39], especially as to the volume of credits. In particular, the volume of such a program should be chosen at the level of 120 credits, which will combine economic skills and capabilities in Data Science.

So, if we are talking about the training of data specialists at the Faculty of Humanities, as the case – the faculty of economics, then, of course, the component of economic professionalism should be in the Curricular. As well as the fact that the university is moving to the paradigm of innovation and entrepreneurship, this, in turn, makes it necessary to make a component of entrepreneurship in the training of masters. However, this fact, on the contrary, is relevant and able to provide exactly the link to business and organizational skills, which is in lack in preparation of students at the engineering faculties.

Thus, according to the world market requirements, Data scientists must have the following technical skills: Domain Knowledge, Data Governance, Operational Analytics, Data Visualization, Research Methods, Data Engineering, Statistical Techniques, Methods and Algorithms, Computing. Accordingly, taking into account the requirements of the state standard, we can offer the following list of competencies for educational and professional master degree programs (Table 3). Considering that Table 3 is constructed based on the state standard [38] that can be perverted in the author's way, the integral competence contains knowledge, skills and attitudes for the particular master degree programme.

Table 3

The case of the master degree programme in DSA at the economic faculty: list of competencies

Integral competencies	Description
Integral competence	Ability to identify and solve complex economic problems, to make appropriate

	analytical and managerial decisions in the field of economics or in the learning process, which involves research and/or innovation under uncertain conditions and requirements.
General Competences (GC)	GC 1. Ability to generate new ideas (creativity). GC 2. Ability to abstract thinking, analysis and synthesis. GC 3. Ability to motivate people and move towards a common goal. GC 4. Ability to communicate with representatives of other professional groups of different levels (with experts from other fields of knowledge/types of economic activity). GC 5. Ability to work in a team. GC 6. Ability to develop and manage projects. GC 7. Ability to act based on ethical considerations (motives). GC 8. Ability to research the appropriate level
Professional competencies of the speciality (PC)	PC 1. Ability to use scientific, analytical, methodological tools to justify the development strategy of economic entities and related management decisions. PC 2. Ability to professional communication in the field of economics in a foreign language. PC 3. Ability to collect, analyze and process statistical data, scientific and analytical materials that are necessary to solve complex economic problems, to draw sound conclusions based on them. PC 4. Ability to use modern information technologies, methods and techniques of research of economic and social processes, adequate to the established needs of research. PC 5. Ability to identify key trends in socio-economic and human development. PC 6. Ability to formulate professional tasks in the field of economics and solve them, choosing the appropriate directions and appropriate methods for their solution, taking into account the available resources. PC 7. Ability to substantiate management decisions on the effective development of business entities.

	PC 8. Ability to assess possible risks, socio-economic consequences of management decisions. PC 9. Ability to apply a scientific approach to the formation and implementation of effective projects in the socio-economic field. PC 10. Ability to develop scenarios and strategies for socio-economic systems. PC 11. Ability to plan, conduct and publicly present the results of scientific research. PC 12. Ability to select, critically evaluate Big Data and infrastructure services from major providers of cloud services and use them taking into account the issue of security and confidentiality. PC 13. Ability to programme to process data, visualize them, and build predictive models and algorithms. PC 14. Ability to independently choose systems for data collection, aggregation and storage and preparation of such data to make the necessary decisions. PC 15. Ability to work in interdisciplinary, international teams using the principles of ethics, respect for other cultures using a foreign language at a professional level. PC 16. Ability to use, analyze, process information about the latest phenomena and processes of socio-economic development of society, to determine new relationships between them

The formation of these competencies (Table 3) allows the formation of an approximate model of learning (Table 4) (example of educational & scientific program as a case for training specialists at the Faculty of Economics, economic cybernetics Department, Taras Shevchenko National University of Kyiv).

Table 4

The case of the master degree programme in DSA at the economic faculty: an approximate model of learning*

Discipline	Focus on achieving competencies	Credits	Currently taught at the Faculty of economics
1st study semester			
Introduction to the study programme3	**GC: 1, 7, 8** **PC: 1, 4**	**6**	**+**
Statistical analysis1	**GC: 2, 8** **PC: 3, 4, 7**	**6**	**-**
Applied Economics1	**GC: 8**	**6**	**+**

	PC: 1, 3, 5, 6, 10		
Decision theory1	**GC: 3, 4, 6, 7** **PC: 6, 7, 9**	**6**	**+**
Python in Data Science1	**GC: 2, 8** **PC: 2, 9, 12, 13, 14**	**6**	**-**
	2d study semester		
Big data infrastructure and technologies1	**GC: 1, 8** **PC: 1, 6, 9, 12, 13**	**6**	**-**
Fundamentals for Data Science1	**GC: 6** **PC: 3, 4, 12, 13, 16**	**6**	**-**
Working with data and their visualization1	**GC: 2, 6** **PC: 3, 12, 13, 14**	**6**	**-**
Advanced forecasting methods1	**GC: 1, 2** **PC: 3, 7, 8, 10, 14**	**6**	**+**
Machine learning and data analysis1	**GC: 1, 4, 6** **PC: 3, 9, 10, 12, 13**	**6**	**+**
	3d study semester		
Soft skills for IT3	**GC: 3, 4, 5, 7** **PC:8, 9**	**5**	**-**
Deep learning1	**GC: 2** **PC: 12, 13, 14, 15**	**5**	**+**
Innovative entrepreneurship2	**GC: 1, 4, 6** **PC: 1, 7, 16**	**5**	**+**
Training on developing start-ups2		**5**	**-**
Optional course2 (Sustainable Development Policy / Project Management / Industrial Organization)		**5**	**+**
Optional course2 (Advanced Microeconomics / Behavioural economics / Welfare Economics / Advanced Macroeconomics / Modern Financial Markets)		**5**	**+**
	4th study semester		
Optional course1 (Fundamentals of		**5**	**+**

systems analysis / Neural networks and time series forecasting)			
Optional course3 (Soft skills for entrepreneurship / Training on negotiations / Public speech training)		**5**	**-**
Optional course3 (Advanced English (C1-C2) / Foreign language)		**5**	**-**
Industry Internship2	**GC: 4, 5 PC: 12, 13, 14, 15, 16**	**6**	**+**
Qualifying work of the master1 (master thesis / project)	**GC: 1, 6, 7, 8 PC: 1, 3, 6, 14, 16**	**9**	**+**

* Courses that support technical skills are signals with 1; business and organizational skills – 2; workplace skills – 3.

Given the conditions for admission to a master's degree in Ukraine, the task of this program is to prepare a DSA specialist for the labour market in two academic years, despite the wide range of possible bachelor's degrees. 50% of the program can be taught in English to ensure the competitiveness of the graduate in the international labour market and for intercultural cooperation.

Each introductory course included an active learning design to engage students. To increase retention, all major courses included assignments designed to build skills but also student confidence in their ability to learn challenging technical topics. Outside of the classroom, opportunities are created for professional advancement and developed a technical culture at the university.

5. Discussion and Conclusions

Digitalization is transforming all facets of society, not just work environments, and in terms of educational contexts, the transformation is occurring with or without strategic initiatives that ensure the ongoing quality of teaching and learning environments. Integration of technology into teaching and learning is not new, but the rapid rate and pace of technological advancement are new, especially regarding new Internet, ICT and digital technologies. The field of education is mainly reactive, as new disruptive technologies develop in other industries and are the applied and accommodated into existing educational cultures and systems. The transformative potential of digitalization in education is exciting and presents many opportunities and challenges, given new trends and developments in digital technologies. This paper provides an overview of the DSA master degree programme in education of HEI.

Taking into account that gap between demand and supply in DSA graduates estimated 769,000 (2020) or 9.8% (Final Report on European Data Market Study by IDC (Feb 2017)), the necessity in the well-designed university study programmes is high, especially in Ukraine.

Our findings added to the conclusion that DSA sits at the top of the skills shortage and that this shortage has a negative impact on economies [40]. That is very crucial in Ukraine as well.

Based on the foregoing, this study advances two main recommendations. First is the need to adopt a master degree university study programmes framework to define DSA. Currently, by the inward of this paper,

particularly, the professional maturity model is being enhanced and can be an appropriate starting point in aligning the demand and supply of DSA workers and competencies in Ukraine.

Secondly, a common understanding of this emerging market for the DSA workforce can benefit the different stakeholders:

- master degree DSA programmes at the social faculties must continuously update its professional maturity model to ensure its validity and relevance to Ukraine;
- analytic companies can make use of the framework as a basis for hiring and developing DSA talents;
- relevant government agencies can collaborate with industry players more efficiently through policies and programs fitting to the Ukrainian industry needs;
- the Ministry on Higher Education can use the framework in creating new standards for the degree programs in DSA or in updating existing DSA-related degree programs to accommodate the DSA competencies as learning outcomes;
- HEIs can use the proposed framework to design programs in DSA, improve their existing programs, and increase their capability in enabling their graduates to be industry-ready DSA workers;
- the government must increase the public's awareness of the DSA professions or students can choose a DSA career by taking related undergraduate programs not only at the engineering faculties.

In this work, an attempt was made to create a new educational program that could produce not just a person who is able to work with data and perform their analysis, not just a user of the software. The main goal should be to form a new type of professional who can work with software to process large unstructured databases with a deep understanding of economics, business processes that can apply the skills of working with DSA in specific enterprises of the real economy. Such a program should become a rather ambitious task for the leading HEIs, which really should prepare specialists for the labour market. Unfortunately, today, there is a real shortage of such specialists, which leads to not-adequate large salaries in this area, which deepens social problems in Ukraine and the world.

Implementation and flexible development of such a master degree programme should increase competition in the field of data science, and enhance the development of technologies for its application, increase opportunities and relevant results in this area. The belief is that this will not only improve the skills of employees in the economic sphere, but also through the active involvement of joint projects will lead to greater communication between business and entrepreneurial universities, and thus provide new opportunities for real development of Ukrainian education and its financial autonomy.

However, the potential limitations of the paper should be indicated. There is a necessity of the demand survey for such programmes among young people (students of a bachelor degree) as well as among the specialists who would like to change their career or have the interest towards their life-long learning. Despite the claimed autonomy of the universities in Ukraine the changes in the existing programmes and the launch of the new ones is still the challenge and the potential gap for future researches.

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